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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/722,003	11/25/2003	Steven Charles Miller	133312UL	6975

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EXAMINER

JAWORSKI, FRANCIS J

ART UNIT	PAPER NUMBER
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3737

DATE MAILED: 09/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/722,003	Applicant(s) MILLER, STEVEN CHARLES	
	Examiner Jaworski Francis J.	Art Unit 3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on IDS 3/15/04.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3-15-04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 – 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The terminology “ wherein each set of received echoes that corresponds to a single transmitted wave defines a steering frame ” in base claims 1, 12 and 22 is used by the claim to apparently mean that a frame of imaging data may pertain to a line or a scan plane of data or to a scanplane set or a scanplane, while the accepted meaning is “a complete planar image data set.” The terminology is therefore is indefinite because the specification does not clearly redefine the term.

Specifically, the specification in para [0004] sets forth that each received echo set corresponding to one transmitted wave constitutes a steering frame, understood by the Examiner to pertain to an image data frame. Para [0015] states that the acquisition techniques include a variety of scanning modalities in terms which are indistinct and/or

ambiguous. (Specifically, 3D scanning and 3D imaging and volume scanning are generally synonymous as are matrix and 2D transducers in one sense, however in another sense 2D transducers may pertain to the fact that only a planar 2D scan is performed as in the use of a linear phased array. Any of a one-dimensional array such as a linear phased array or even a single transducer may also produce a 3D volume scan by augmenting scan directioning by mechanical means.) Para [0016] then states that the unit of data obtained at each stationary transducer position constitutes one or more scanplanes. However positional stationarity does not equate to a single transmitted wave, because a linear phased array may be electronically steered without mechanical motion to obtain a scanplane frame whereas a mechanical transducer obtains only one scanline per firing, see Pini (US5159931) col. 5 lines 37-68 in the context of performing a conical 3D or volume scan. A single transmitted wave in turn can produce a single scan line (such as a line of the steered image frame set at a stationary rotational position of the array of Pini or a line of an image frame set obtained by oscillating the alternative mechanical transducer of Pini using its own motor at a stationary rotational position), or multiple echo scanlines in a plane (such as in Lysyansky et al (US6221020) Fig. 3 and col. 6 lines 53-62 describing multi-line acquisition using a broad beam) or provide an entirety of a scanplane of data from a single whole-array transmission (such as Liu (US6685641) see abstract) or provide echo data which is not confined to a plane (such as in the Powers et al (US6623432) col. 13 top half which is describing multi-line acquisition extended to volume subsets or such as the broadbeam ensonation of McLaughlin et al (US6685645) which produces

up to one frame of imaged data per transmission firing by multi-dimensional area echo reception from a single firing).

Additionally it is unclear whether a 'steering frame' is pertaining to an echo data set at a fixed transducer position (whether the data itself derives from one, two or three dimensions) or to a data set derived from steering in a plane with secondary unprogrammed motion such as freehand motion stilled (e.g. either transducer technique of Pini at a fixed rotational orientation) or to some other definition (the McLaughlin et al patent for example pertains to display frame rates i.e inter alia to rendered views from the 3D voxel set as approaching 1:1 with beam firings, i.e. very fast image refresh)..

In summary then all base claims are held to be indefinite since they appear to be invoking an unconventional or imprecise definition.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1 - 31 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Under at least some interpretations the claims pertain to compounding based on echo data sets which are themselves volumetric at each stationary array position (para [0016

lines 3-6]). Hence adaptive compounding of volume subsets is apparently being invoked however no indication of how to perform volumetric compounding is provided, and as noted above, broadbeam or MLA volume subset techniques yield unconventional subvolume units which would be the unit inputs to such a process yet no description is provided as to how this circumstance is accommodated.

Claim Rejections - 35 USC § 102/103

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5, 8-15, 18-25 and 28-31 are rejected under 35 U.S.C. 102(e) as being anticipated by Hossack et al (US6641536) or in the alternative under 35 USC 103(a) as obvious based upon Hossack et al in view of Robinson et al (US621032, of record in applicant's IDS).

Under the former rejection the Examiner is arbitrating the indefinite terminology noted above as broadly pertaining to obtaining a unit steering image frame for compounding while the transducer is locationally fixed whereupon Hossack et al inter alia col. 22 lines 25-41 in context pertain to adaptive compounding using processor algorithms where the number of frames is adaptively determined by the level of transducer velocity or motion as determined by image correlation or SAD techniques.

In the alternative, if the aforementioned language at issue be interpreted as directed to MLA techniques then it would have been obvious in view of Robinson et al to

use simultaneous line acquisitions during compounding since this enables faster scan rates or wider component scans, see col. 6 lines 56-59.


Claims 6, 16, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hossack et al alone or further in view of Robinson et al as applied to claim 3 above, and further in view of Weng (US5566674) insofar as the latter teaches that a compounded image IR-SC should serve as a misregistration reference during compounding since it is less noise corruptible.

Claims 7, 17, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hossack et al alone or further in view of Robinson et al as applied to claim 3 above, and further in view of Li et al (US2005/0075569 based upon the provisional filing date) alone or further in view of Tirumalai et al (US6872181). It would have been obvious in view of the latter para [0032] as representative to control the frame averaging in accordance with misregistration (motion causing loss of stationary registration) in accordance with plural threshold levels. In the alternative, whereas Li et al is concerned with adaptive frame averaging that is, temporal compounding in the case of motion, it would have been obvious in view of Tirumalai et al directed like the former to spatial compounding, in col. 7 lines 13-53 to use thresholds of misregistration in order to relate motion amount to degree of misregistration.

Any inquiry concerning this communication should be directed to Jaworski Francis J. at telephone number 571-272-4738.

FJJ:fjj

09252005



Francis J. Jaworski
Primary Examiner